

Proposal to NASA NRA-95-MTPE-03
EXISTING FACILITY INSTRUMENTS AND MISSIONS: MODIS

A Global Land Surface Reflectance Product for use in MODIS land algorithms

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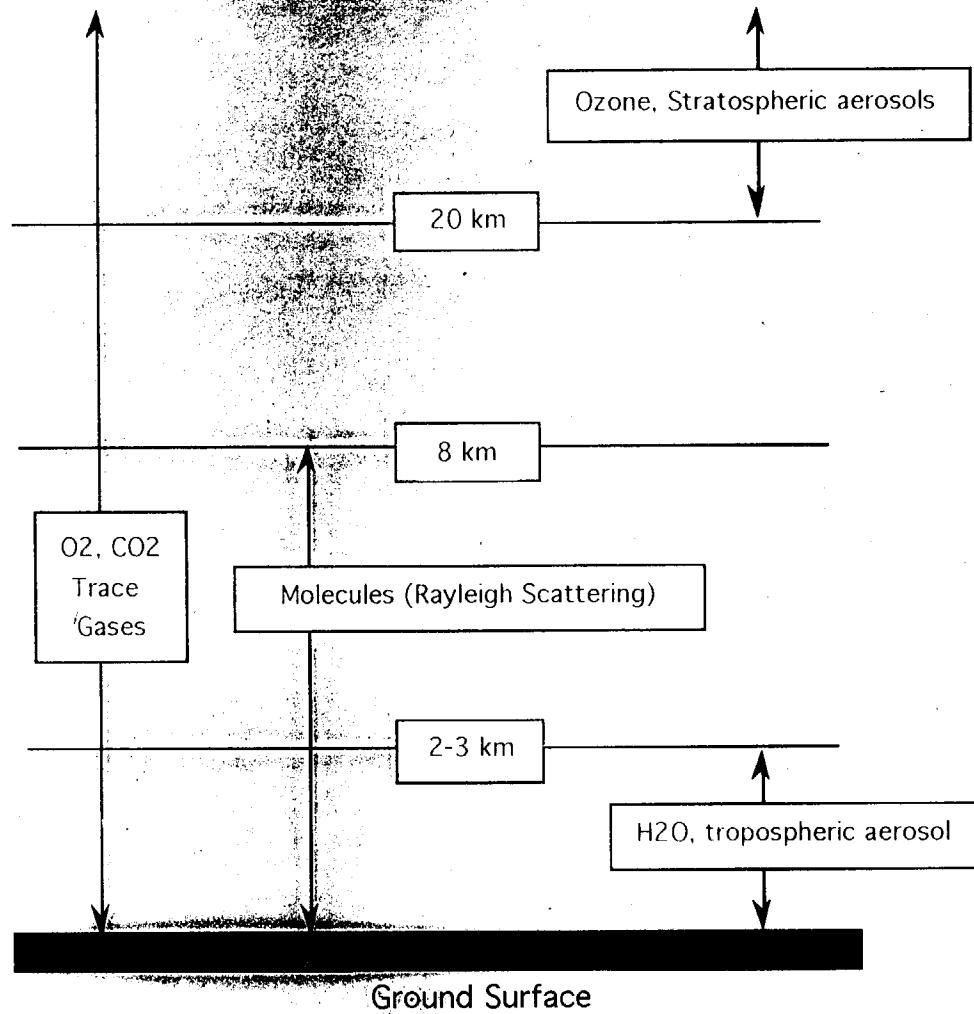
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Atmosphere Description



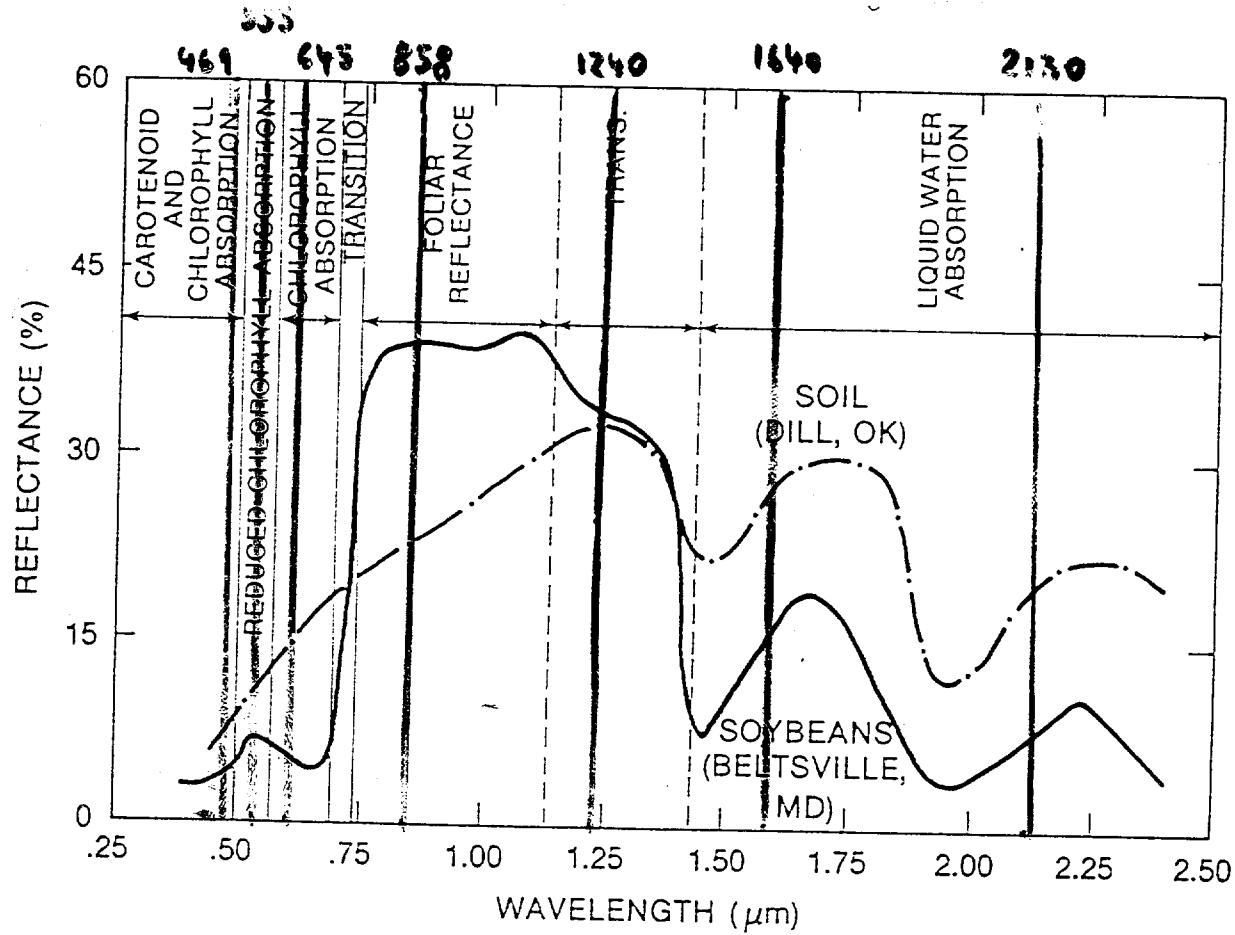
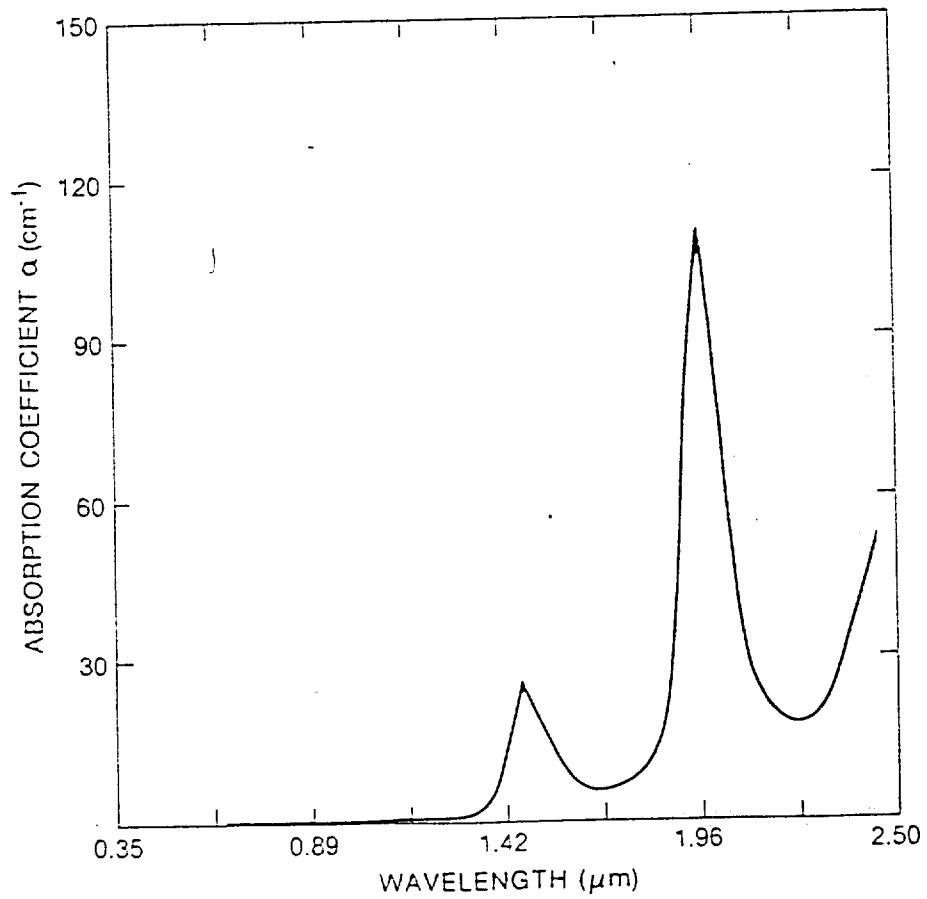


Figure 2. Reflectance spectra of soil, soybeans, and a dill plant.



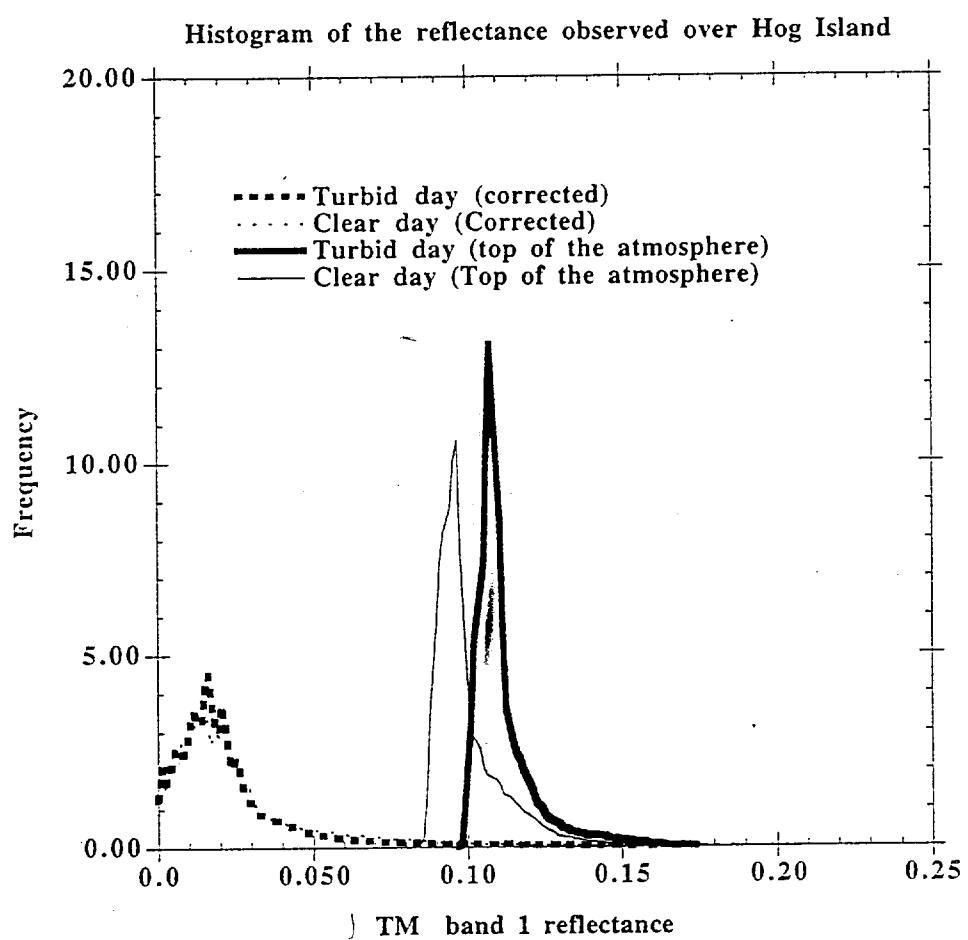


Figure 9b: test of the result of the atmospheric correction procedure (including aerosol retrieval and atmospheric point spread function correction) for a 1000x1000 TM pixels area of the Hog Island site for the clear and hazy day for TM band 1.

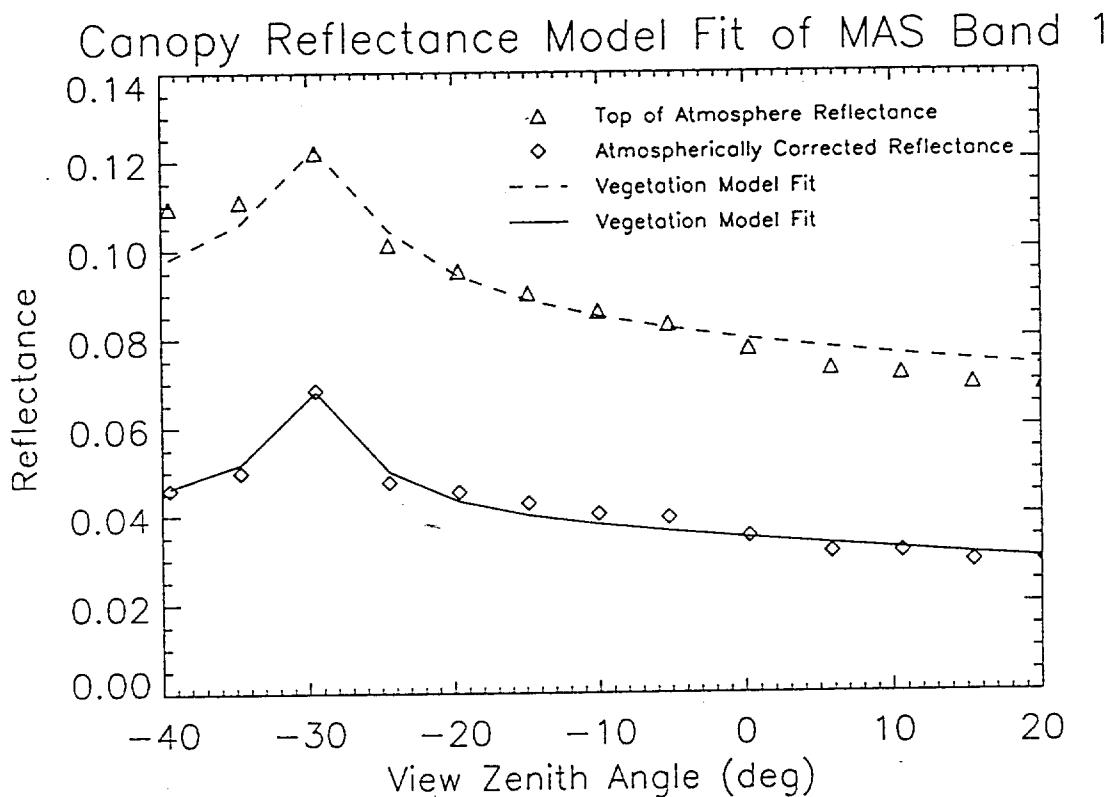


Figure 10c: fits of MAS principal plane data using Myneni et al. model (1992) using corrected (plain lines, diamonds) and top of the atmosphere (dashed line, triangles) for the green band ($0.55\mu\text{m}$).

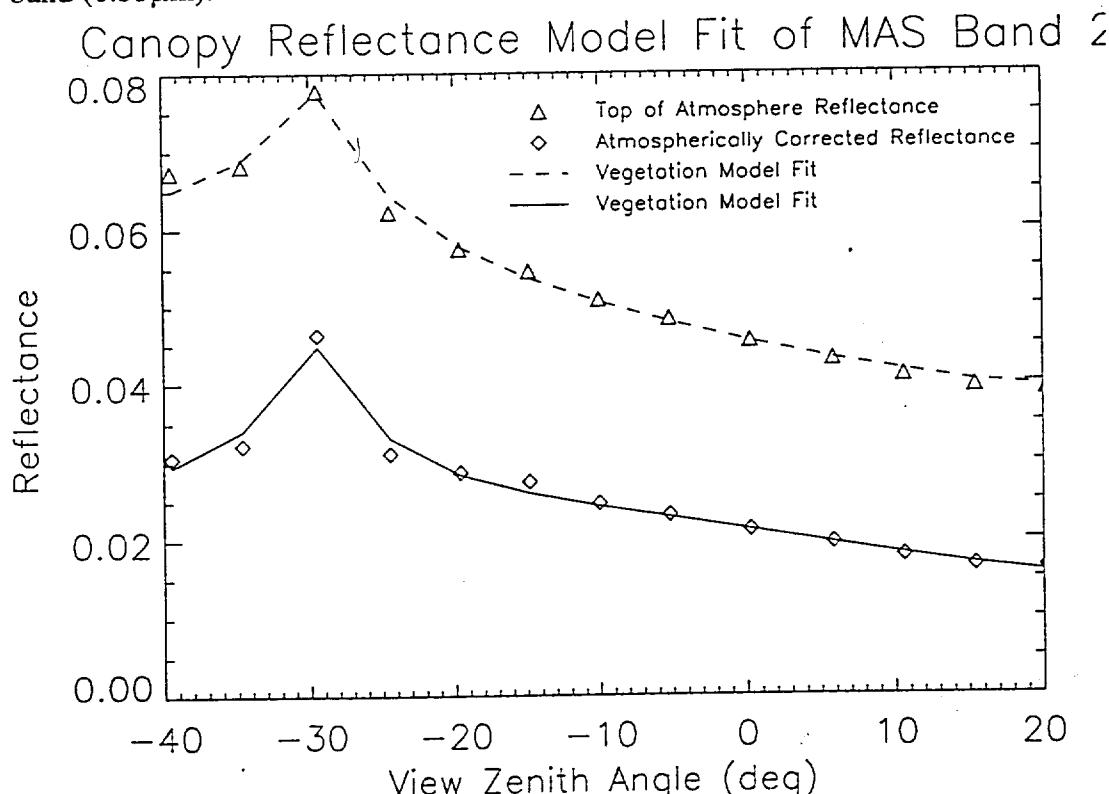


Figure 10d: fits of MAS principal plane data using Myneni et al. model (1992) using corrected (plain lines, diamonds) and top of the atmosphere (dashed line, triangles) for the red band ($0.67\mu\text{m}$).

Results of the inversion of top of the atmosphere and top of the canopy using SCAR-A MAS dataset.

	Leaf Area Index	Leaf Refractivity	Leaf Angle Distribution	RMS
TOA Band 1	0.4 (>3)	0.010 (0.05-0.25)	planophile (erectophile)	0.26×10^{-3}
TOC Band 1	9.2 (>3)	0.105 (0.05-0.25)	erectophile (erectophile)	0.44×10^{-4}
TOA Band 2	1.2 (>3)	0.150 (0.03-0.16)	erectophile (erectophile)	0.135×10^{-4}
TOC Band 2	2.7 (>3)	0.070 (0.03-0.16)	erectophile (erectophile)	0.137×10^{-4}

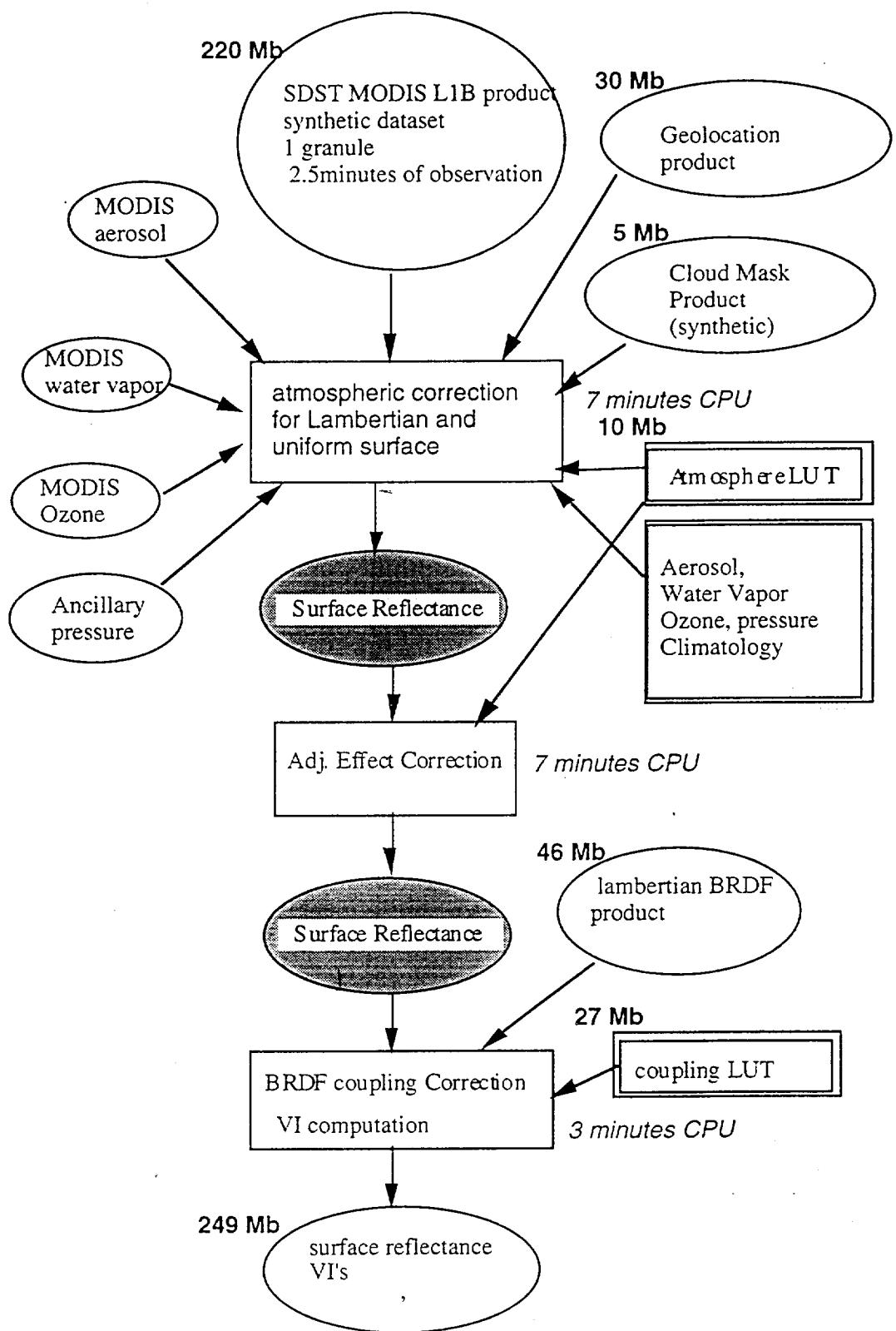
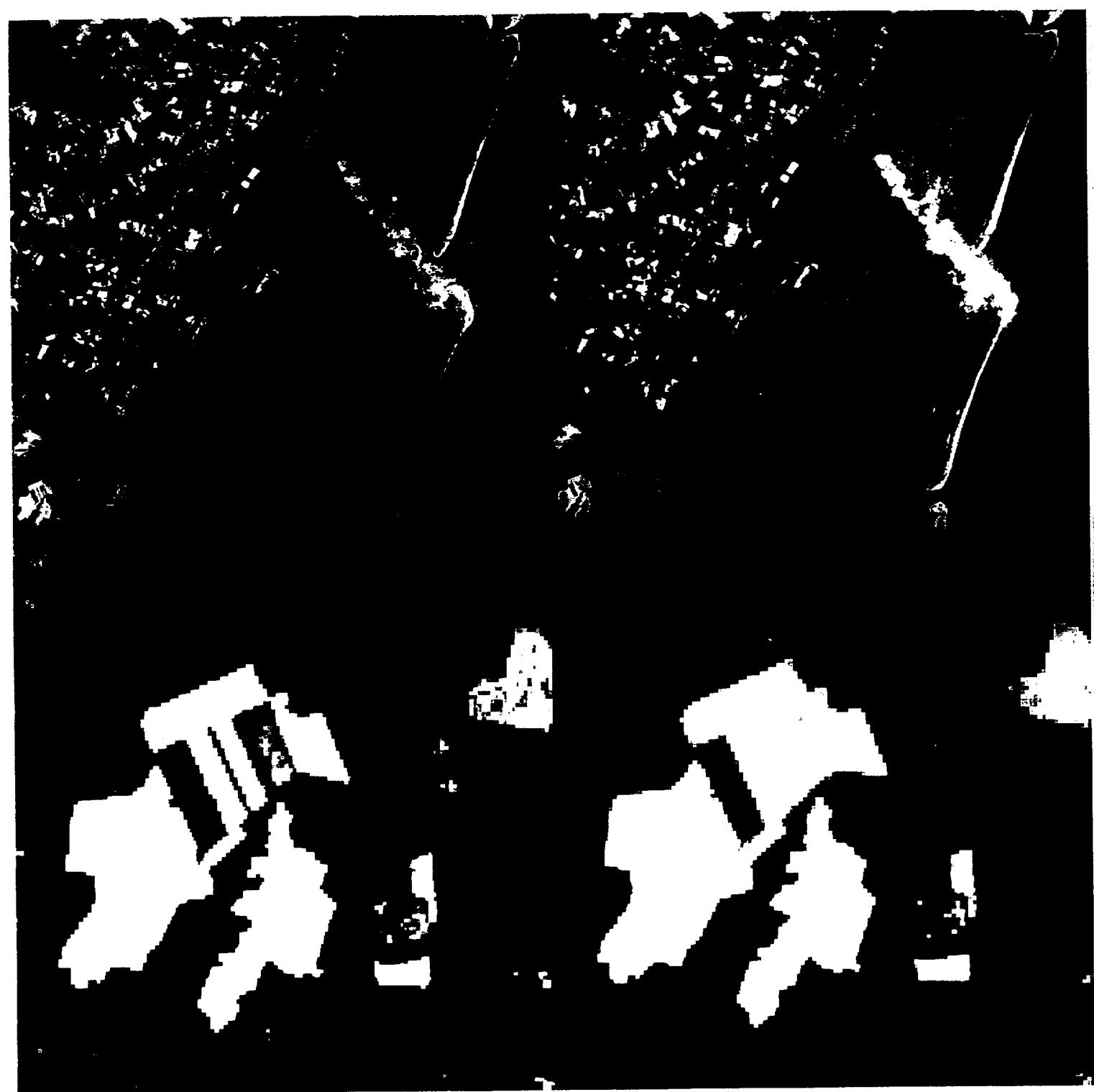


Figure 5: current MODIS atmospheric correction processing thread flow chart.



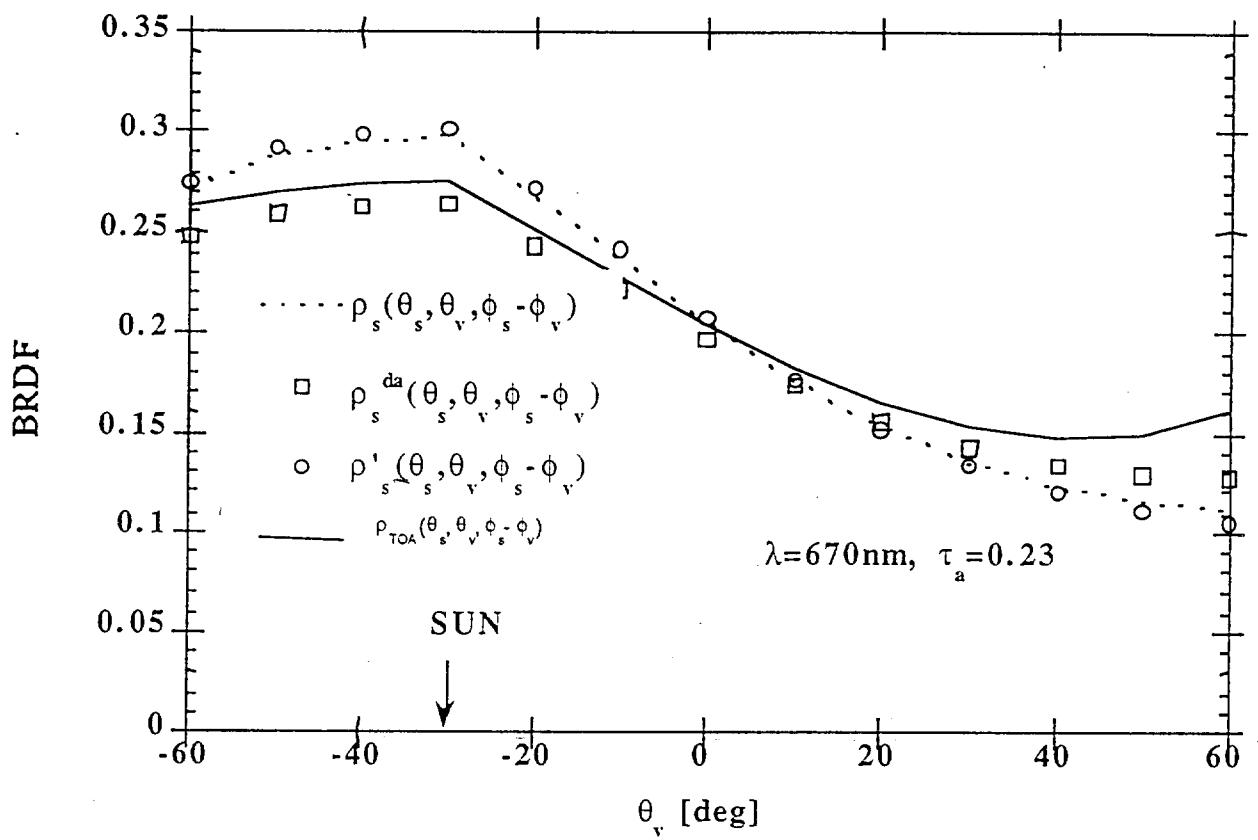
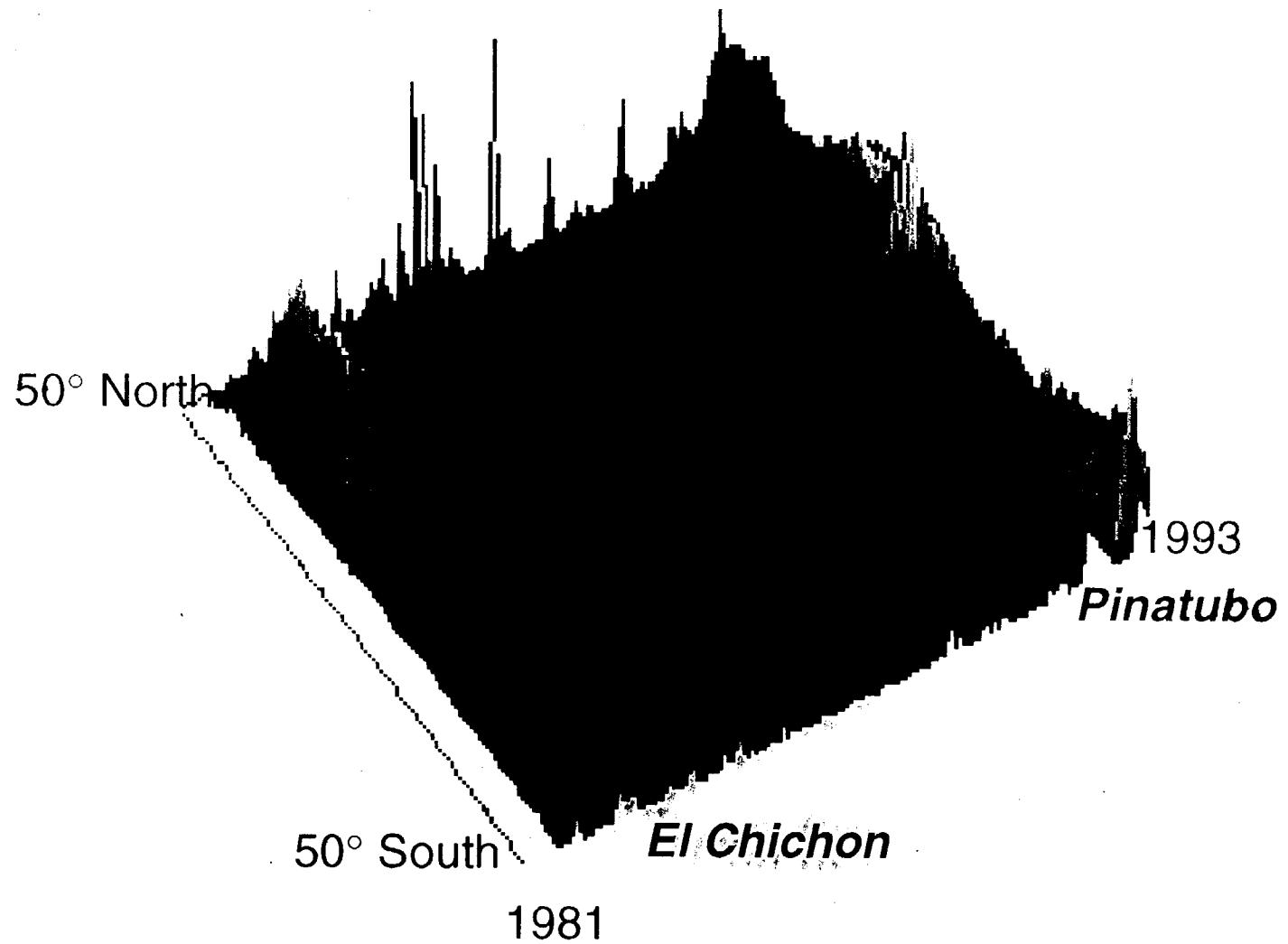


Figure 4: Illustration of the atmosphere-BRDF coupling effect correction. For a Hapke model representation of a plowed field BRDF, ρ_s , the top of the atmosphere signal, ρ_{TOA} , the BRDF retrieved using lambertian hypothesis, ρ_s^{da} , and ρ'_s , the reflectance retrieved using a BRDF derived by inverting Hapke model with the string of ρ_s^{da} values.



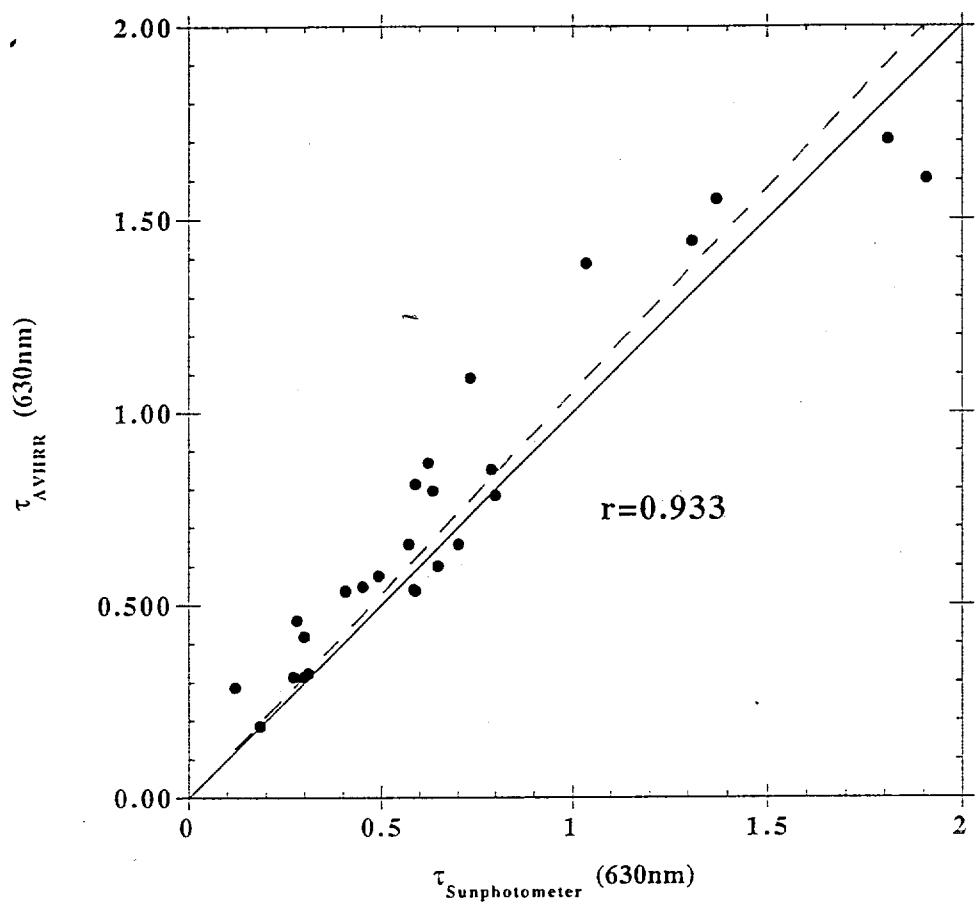


Figure 11c: same as (11b) but in 1993.

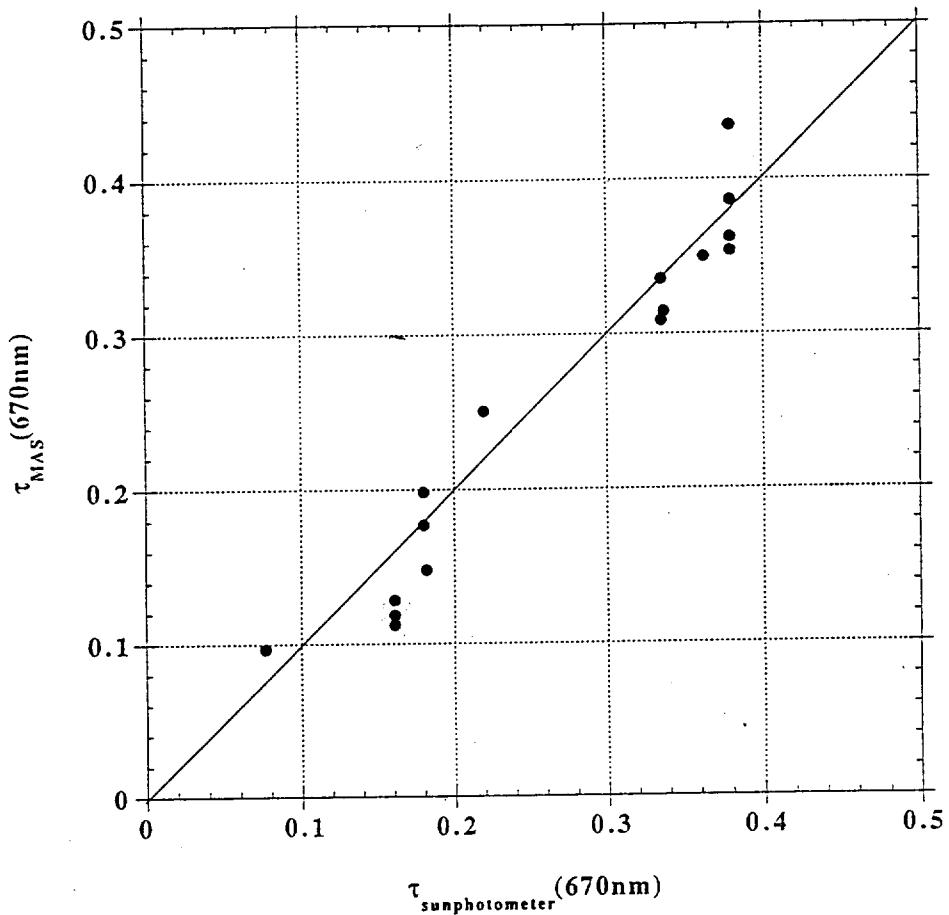


Figure 10a: Retrieval of aerosol optical depth using the dark target technique with the $2.14\mu\text{m}$ from MODIS Airborne simulator data during the SCAR-A experiment (Roger et al, 1994)

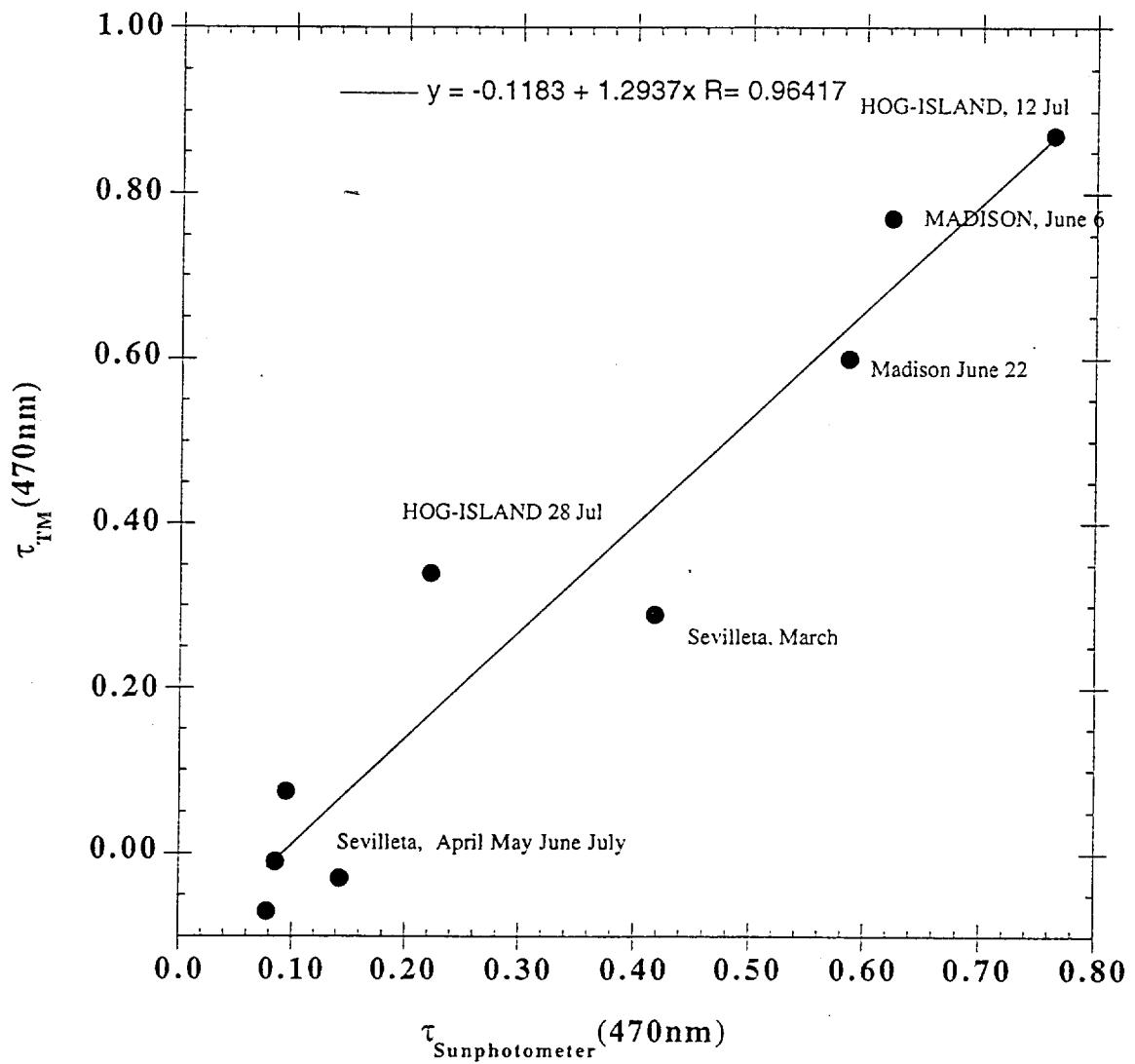
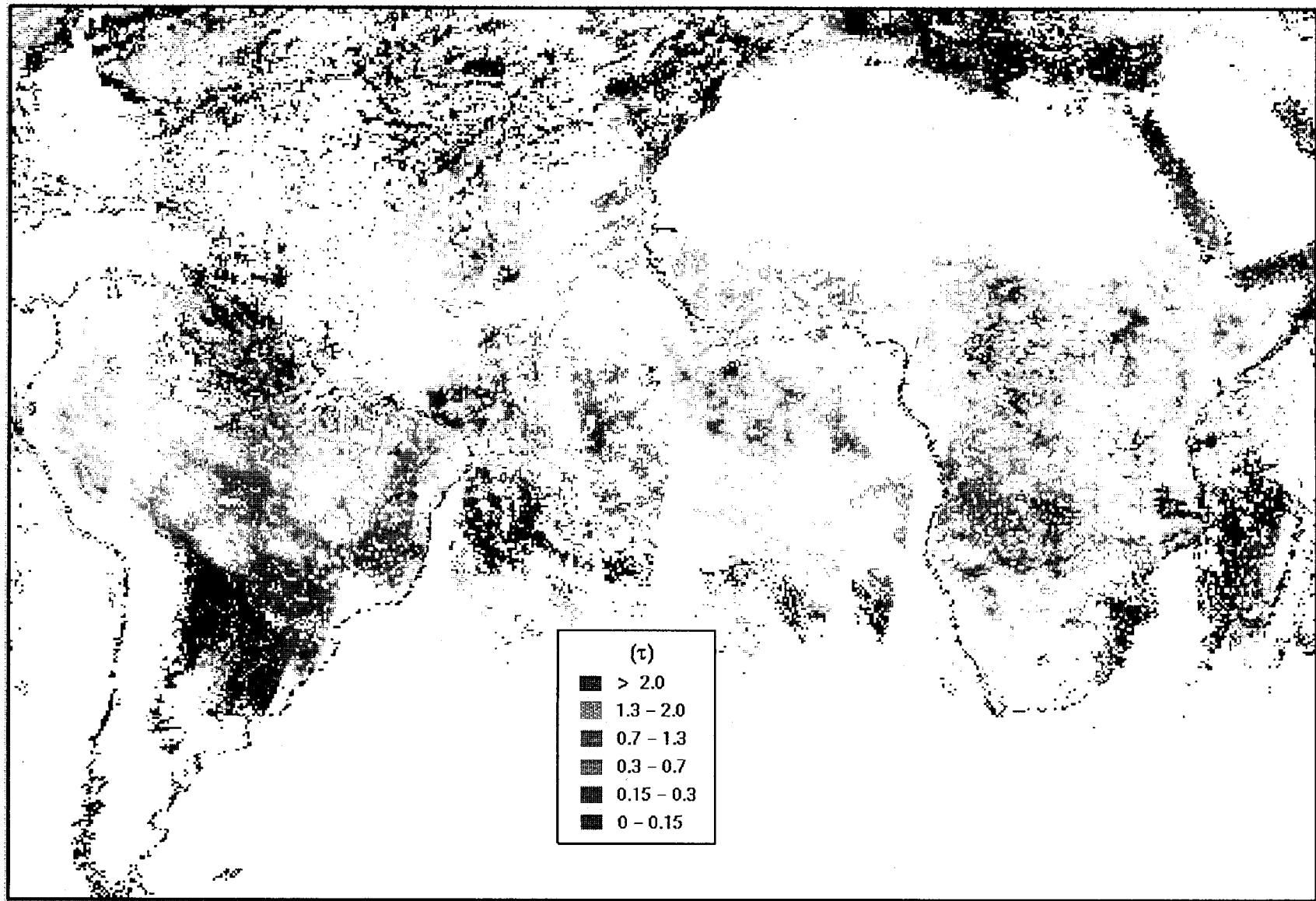
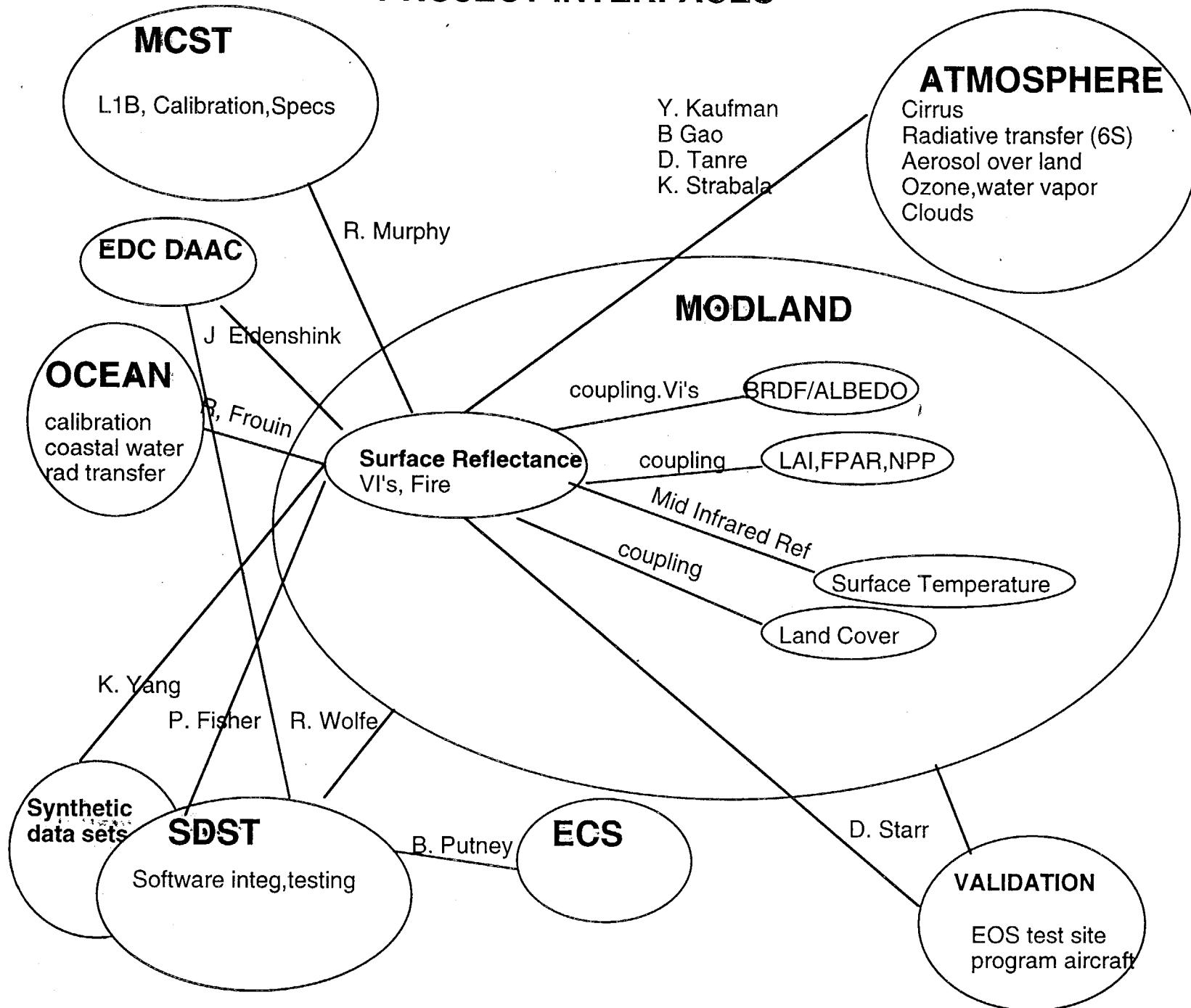


Figure 9a: Retrieval of optical depth in TM channel 1 using the dark target approach (2.13 μ m channel for detection) compared to sunphotometer data.



Project Start	DAAC Version1	DAAC Version2	AM Launch
June 1996	December 1996	December 1997	June 1998
Adjacency effect correction, aerosol and water vapor product ingestion	BRDF coupling, "real" aerosol, water vapor	PM Algorithm evaluation	
DAO evaluation	AEROSOL CLIMATOLOGY		
Test Sites Validation	AVHRR/SeaWiFS/POLDER/Vegetation MODIS prototyping	MODIS vicarious calibration MODIS test site validation	
Metadata handling, QC	scheduler, QA development		

PROJECT INTERFACES



POSSIBLE AREAS OF CONCERN

- 1) Data Processing and ECS Modelling - early (V1) 'end to end' testing at the DAACs
- 2) Instrument Specification and Performance - communication and data and information flow between SBRC/ MCST /SDST and the SCF's
- 3) Land SCF Model for QA implementation - BIG SCF (Miami) or Networking